Ridgeway, Missouri
Harrison County
Water Supply Study
Rock House Lake

Prior to 2004, Ridgeway water supply comes from Rockhouse Lake. Rockhouse Lake was built as one of the Natural Resource Conservation Service's (NRCS) Panther Creek PL-566 watershed project lakes.

The record period of drought was used to estimate if Ridgeway's water supply was adequate to provide ample water during extreme drought. The 1950's were determined to be that period.

The 30-year average annual rainfall is 37.24 inches at Bethany. For the Period 1953 through 1957, annual rainfall was 24.09, 32.05, 27.00, 24.31, and 32.27 inches.

Ridgeway has a storage lake located one mile West of the city of Ridgeway, in sections 32 and 33 in Mission Township. Water is pumped from Rockhouse Lake to the storage lake prior to treatment. Plans are being made to connect the city of Ridgeway to Harrison County rural water supply district Number 3.

Ridgeway used 13,991,000 gallons of water in 1999 (0.038 million gallons per day).

Ridgeway Lake analysis consisted of using the NRCS's computer program called "RESOP". Following is the data and procedures for input to the program.

STO-AREA Elevation-Storage and Elevation-Area data were determined from July 11, 2000 survey made by USGS.

Ridgeway Water Supply
Rock House Lake

Elevation (feet)	Area (acres)	Storage (ac-ft)	
888.0	0.1	0.01	
890.0	0.6	0.7	
892.0	2.1	2.9	
894.0	9.8	14.2	
896.0	20.6	43.3	
898.0	28.3	93.0	
900.0	38.0	159.0	
902.0	43.3	240.0	
904.0	51.6	334.0	
906.0	58.2	443.0	
906.3	60.8	461.0	Full and Spillway Elevation. on 5/28/2003

Spillway Elev. = 906.3 Feet mean sea level.
Minimum Elev. = 21 Acres

LIMITS Maximum Pool storage 461 Ac.Ft.
Minimum Pool storage 50 Ac.Ft.

Starting storage was considered at maximum pool.

The drainage area of the lake is 5723 acres (8.94 square miles).

GENERAL The adjustment factor of 0.76 to convert from pan evaporation to lake evaporation was applied prior to entering the data for the control word EVAP. As a result a factor of 100 is applied.

The record period of drought is in the 1950's.
Analysis began in January 1951 and ended December 1959.

SEEPAGE The reservoir seepage varied from 0 seepage near empty to a maximum of 1.5 inch per month when at full pool. The material in the dam is compacted earth of clayey soils. The lake is shallow so that static pressure is low. As a result seepage is small.

RAINFALL Rainfall data came from the Bethany, Missouri rain gage.

RUNOFF This is the runoff into the lake from its drainage area. Monthly runoff volumes in watershed inches. East Fork Big Creek at Bethany having a drainage area of 95 square miles. Ridgeway is in the East Fork Big Creek watershed. Monthly runoff was compared to the rainfall and if the results did not appear reasonable, adjustments were made for that month by looking at individual rains and estimating anticedent moisture then adjusting runoff based on NRCS's runoff curve numbers.

EVAP. Pan evaporation at the Lakeside gaging station was used as a base because it has data for year around evaporation. This data was updated with gage data from stations at Spickard, New Franklin, and Columbia. Depending on the latest data for the station nearest to Ridgeway. The adjustment factor of 0.76 to convert from pan to lake evaporation was applied at this step.

DEMAND Determined from by city records. Ridgeway reported using 13,991,000 gallons in 1999 for an average daily use of 0.038 million gallons per day in 1999.

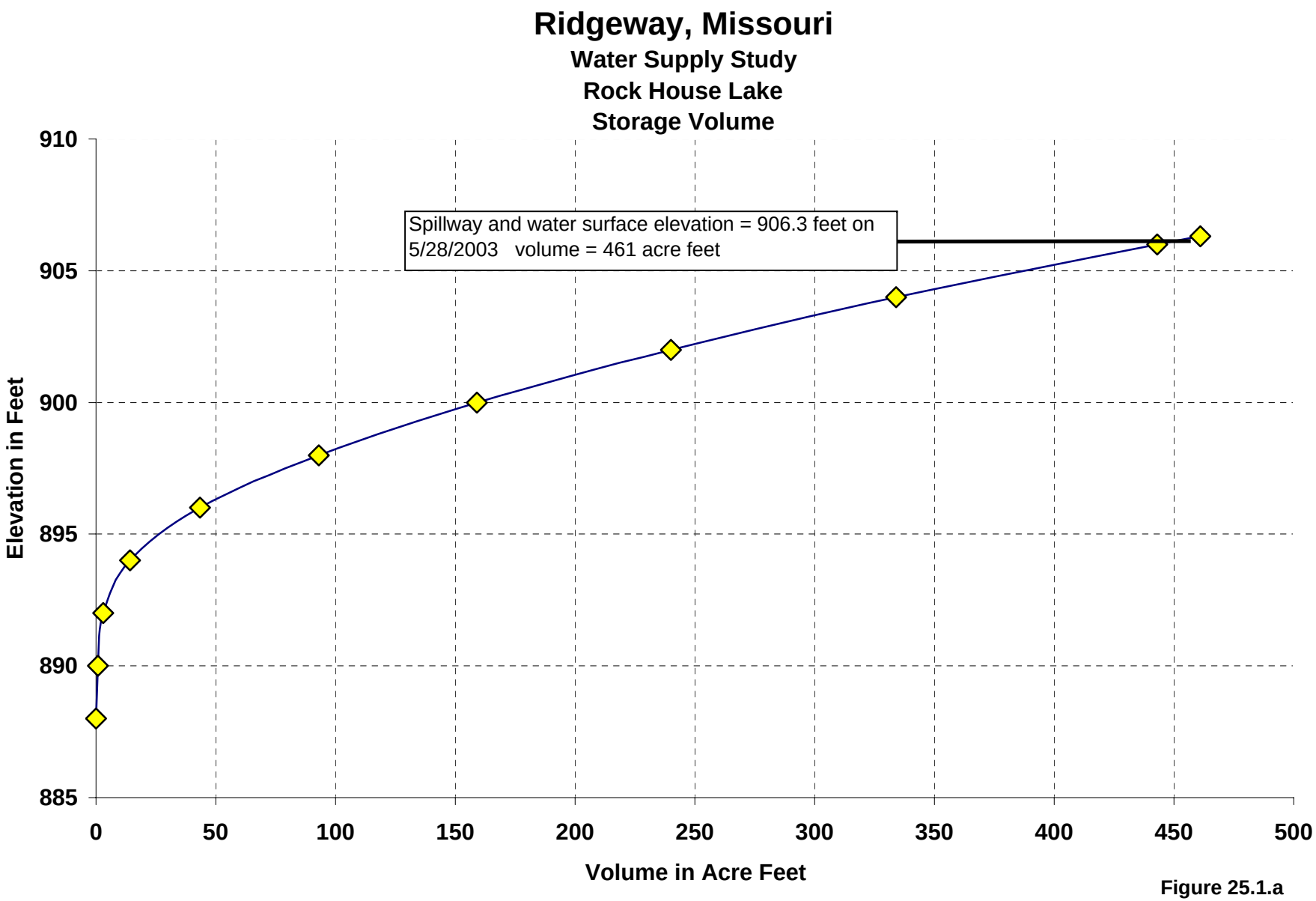

Ridgeway, Missouri
Water Supply Study
Rock House Lake
Storage Volume
Spillway and water surface elevation = 906.3 feet on 5/28/2003 volume = 461 acre feet
Elevation in Feet
910
905
900
895
890
885
0
50
100
150
200
250
300
350
400
450
500
Volume in Acre Feet

Figure 25.1.a

Ridgeway, Missouri

Water Supply Analysis

Rock House Lake

Surface Area

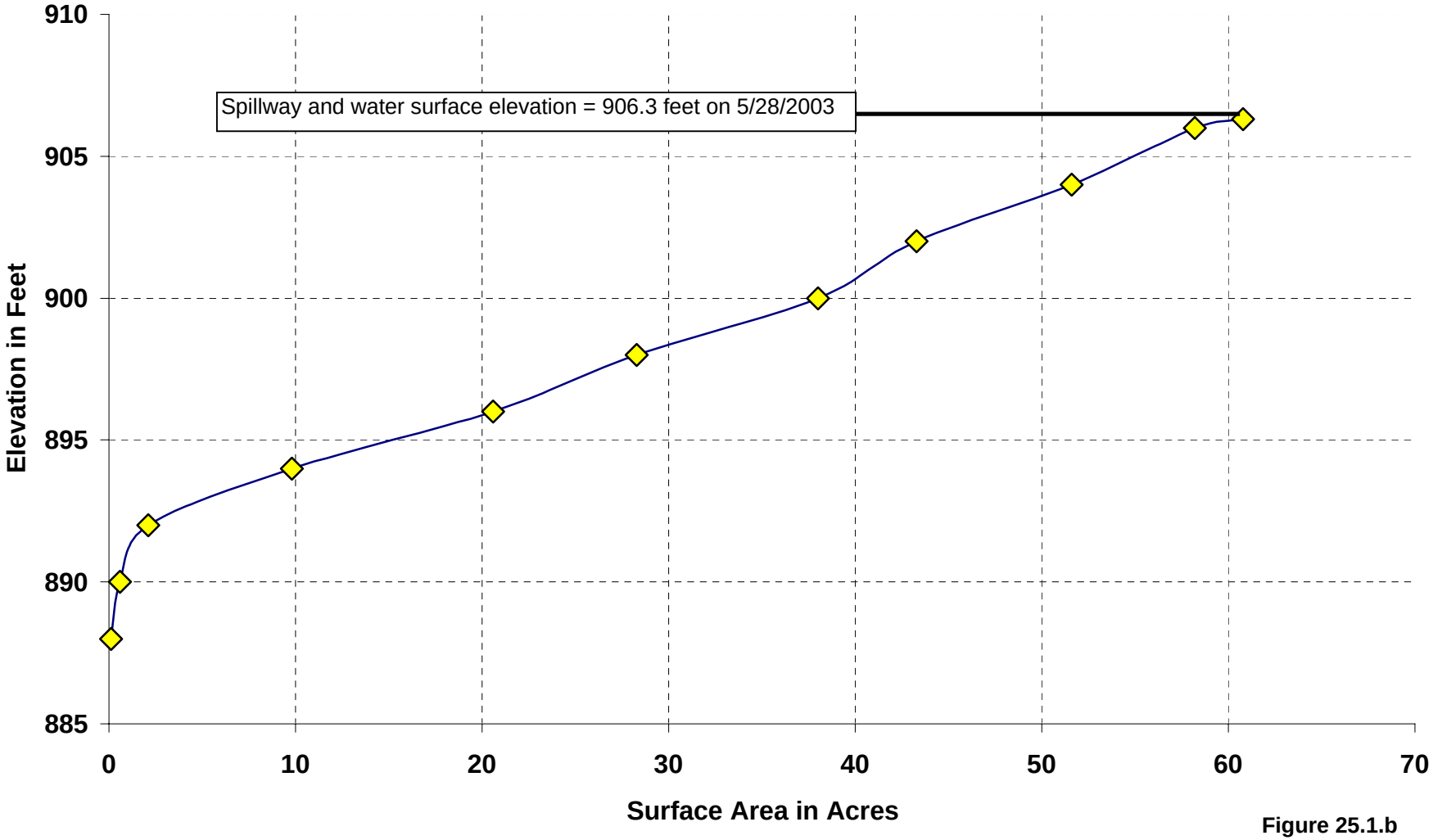


Figure 25.1.b

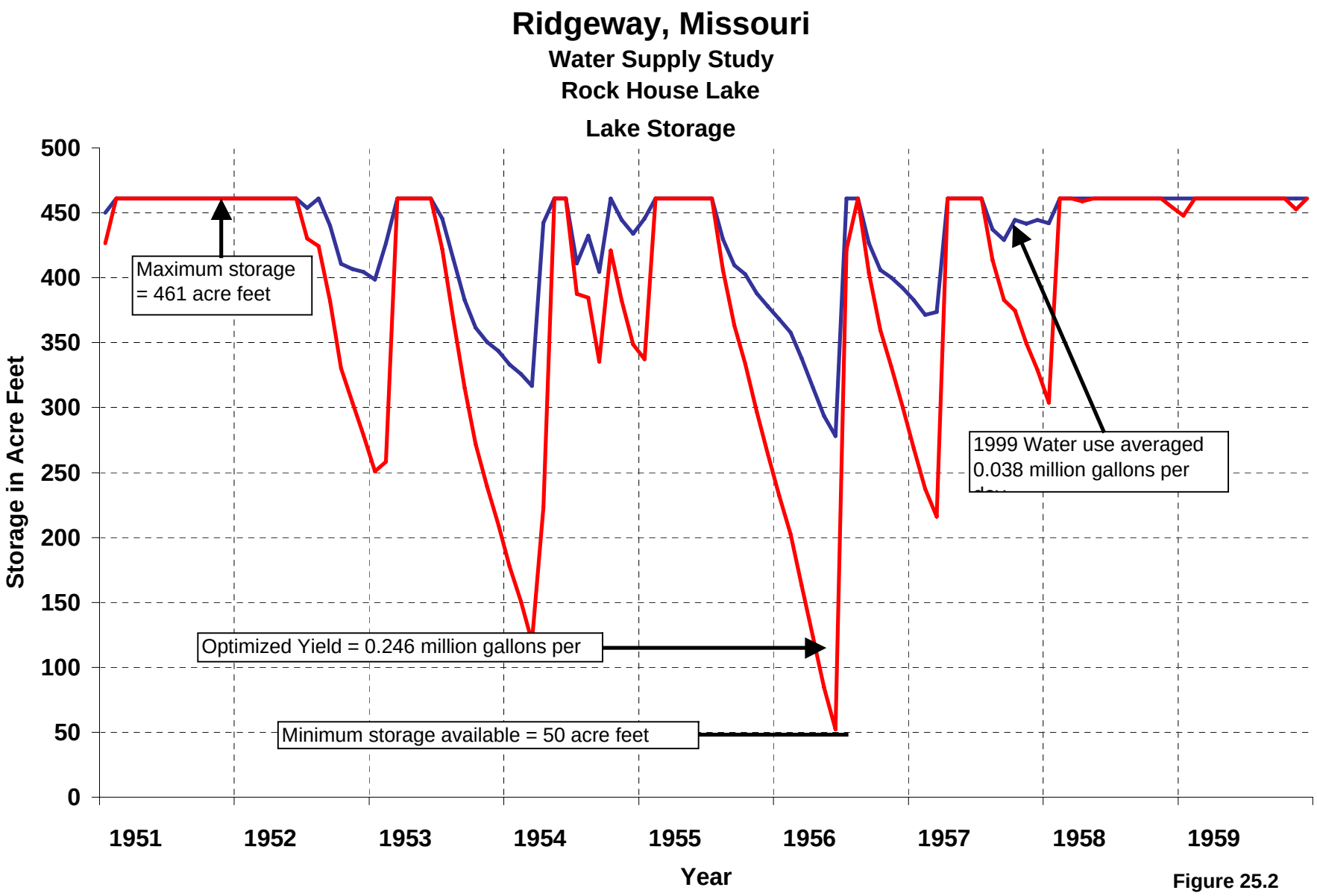

Ridgeway, Missouri
Water Supply Study
Rock House Lake
Lake Storage
Storage in Acre Feet
500
450
400
350
300
250
200
150
100
50
0
Maximum storage
= 461 acre feet
1999 Water use averaged
0.038 million gallons per
Optimized Yield = 0.246 million gallons per
Minimum storage available = 50 acre feet
1951
1952
1953
1954
1955
1956
1957
1958
1959
Year

Figure 25.2

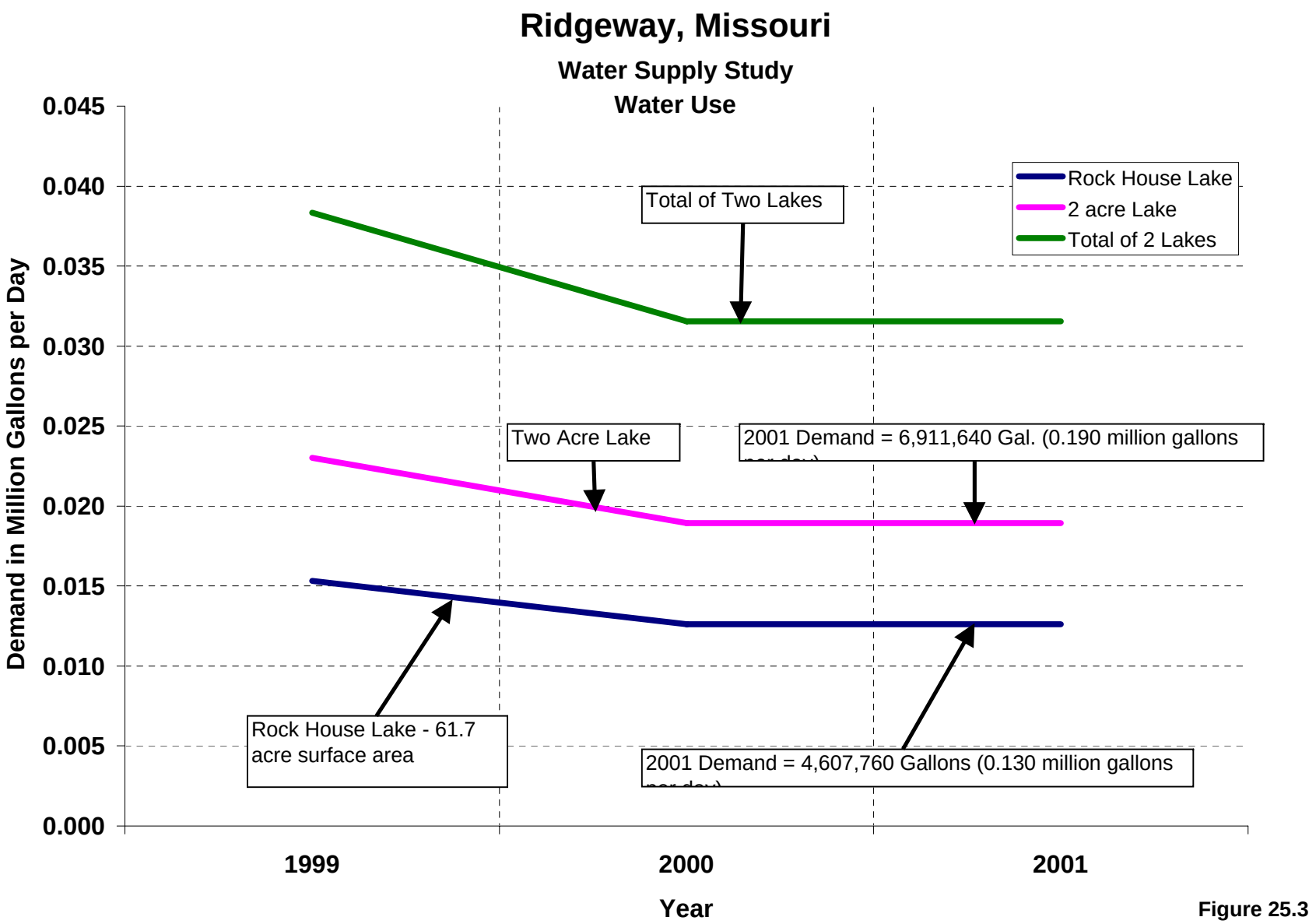
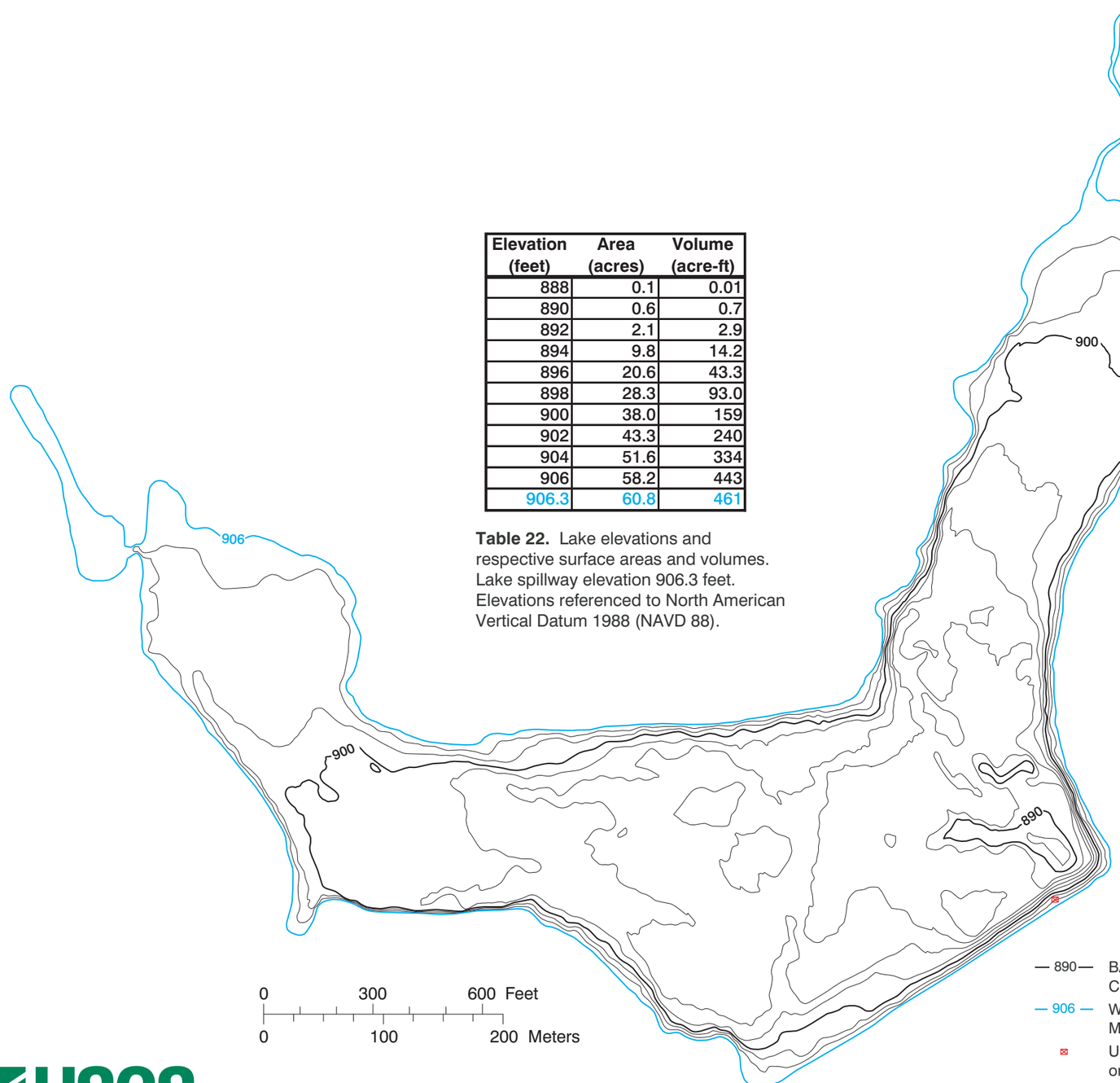

Ridgeway, Missouri
Water Supply Study
Water Use
Demand in Million Gallons per Day
0.045
0.040
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
1999
2000
2001
Year
Rock House Lake
2 acre Lake
Total of 2 Lakes
Total of Two Lakes
Two Acre Lake
2001 Demand = 6,911,640 Gal. (0.190 million gallons
Rock House Lake - 61.7 acre surface area
2001 Demand = 4,607,760 Gallons (0.130 million gallons

Figure 25.3

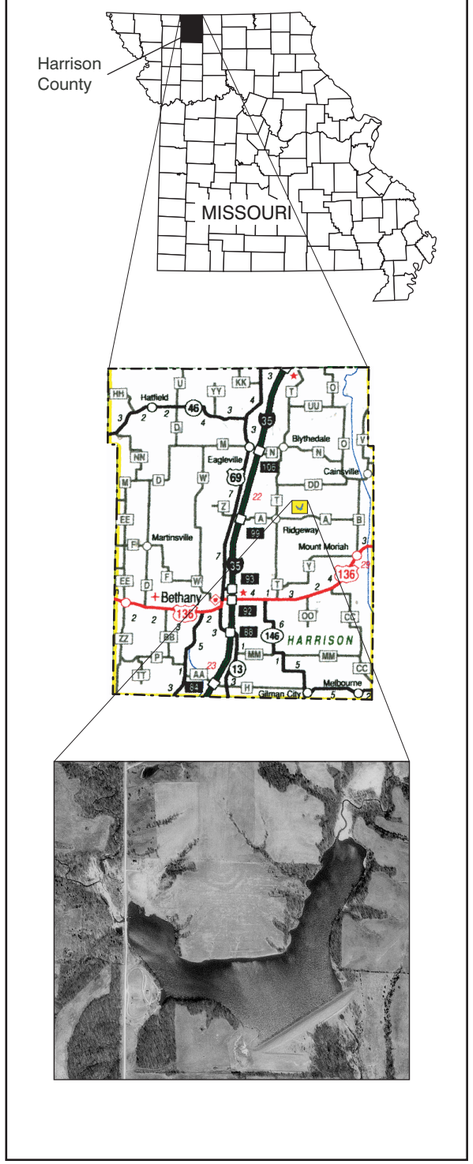
ROCK HOUSE LAKE

Elevation (feet)	Area (acres)	Volume (acre-ft)
888	0.1	0.01
890	0.6	0.7
892	2.1	2.9
894	9.8	14.2
896	20.6	43.3
898	28.3	93.0
900	38.0	159
902	43.3	240
904	51.6	334
906	58.2	443
906.3	60.8	461

Table 22. Lake elevations and respective surface areas and volumes. Lake spillway elevation 906.3 feet. Elevations referenced to North American Vertical Datum 1988 (NAVD 88).



LOCATION MAP



EXPLANATION

— 890 — BATHYMETRIC CONTOUR—Shows altitude of the reservoir bottom. Contour interval 2 feet.

— 906 — WATER SURFACE—Shows approximate elevation of water surface, May 28-29, 2003 (table 22) actual elevation 906.3.

⊠ U. S. GEOLOGICAL SURVEY REFERENCE MARKER—Chiseled arrow on north corner of concrete drop-box spillway. Elevation 910.3 feet.

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Figure 25.4 Bathymetric map and area/volume table for Rock House Lake near Ridgeway, Missouri.